CLAIMS

What is claimed:

1. An assembly for writing and/or erasing high-density data on a recording media as a series of tags comprising an information bit pattern, the assembly comprising:

1) a thermal heater for generating and directing an incident thermal wave to a media;

and

2) a position controller for coordinating a mutual positioning of the incident thermal wave and a media for inducing a direct thermal coupling therebetween;

the assembly acting as a writer/and or eraser by operating the position controller so that writing and/or erasing can be enabled by using an information signal for modulating a localized thermal wave generated in the vicinity of a media.

2. An assembly according to claim 1, wherein the thermal heater comprises:

1) a heating plate that can operate as a heat source;

and

2) a heat sink attached to the heating plate;

the heater capable of developing a thermal near-field coupling with the media.

3. An assembly according to claim 2, wherein the heating plate comprises a tip that can operate as the heat source.

4. An assembly according to claim 2, wherein the heating plate defines a dedicated edge that can operate as the heat source.

5. An assembly according to claim 2, further comprising a focused laser beam thermally coupled to the heat sink.

6. An assembly according to claim 2, further comprising a wave-guided laser beam thermally coupled to the heat sink.

7. An assembly according to claim 2, further comprising a resistive heating unit thermally coupled to the heat sink.

8. An assembly according to claim 1, wherein the thermal heater comprises an atomic force microscope probe.

9. An assembly according to claim 1, wherein the position controller coordinates the mutual positioning of the incident thermal wave and a media for inducing a direct thermal coupling therebetween that subsumes at least one portion of a thermal near-field.

10. An assembly according to claim 1, wherein the thermal coupling subsumes at least one of ballistic, diffusive, conductive, and convective heat transfer.